

## Message Text

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FM USMISSION IAEA VIENNA  
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INFO USERDA HQ WASHDC  
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E.O. 11652: N/A  
TAGS: PARM, TECH, IAEA  
SUBJECT: U.S. SUPPORT PROGRAM FOR IAEA SAFEGUARDS

REF: STATE 161453

SUMMARY: MISSION RECOMMENDATIONS, BASED UPON DISCUSSIONS WITH IAEA INSPECTOR GENERAL ROMETSCH AND HIS SENIOR STAFF, FOR INITIAL DETAILED SCOPE OF SUBJECT PROGRAM ARE PRESENTED, TOGETHER WITH SUPPORTING NARRATIVE. BECAUSE OF UNCERTAINTIES IN TECHNOLOGICAL DEVELOPMENTS AND EXTENT TO WHICH FUTURE IAEA BUDGETS WILL COVER PORTIONS OF IDENTIFIED ITEMS, RECOMMENDATIONS ARE SUBJECT TO CHANGE. SUBJECT PROGRAM SHOULD BE REVIEWED AT LEAST ANNUALLY BY INTERESTED AGENCIES, MISSION AND IAEA. RECOMMEND STANDING INTERAGENCY COMMITTEE, CHAIRED BY FULL-TIME COORDINATOR BE ESTABLISHED AT EARLY DATE TO REVIEW MISSION'S RECOMMENDATIONS, TO CONSIDER ADDITIONAL ITEMS AND TO MONITOR IMPLEMENTATION OF PROGRAM. ACTION REQUESTED: IDENTIFICATION OF PROGRAM COORDINATOR. END SUMMARY.

1. IN ACCORDANCE REFTL, LABOWITZ, GABBERT, HOUCK AND I MET WITH ROMETSCH, VON BAECKMANN, NAKIECENOV AND SHMELEV JULY 14 TO OBTAIN THEIR VIEWS RE SPECIFIC ITEMS MERITING  
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SPECIAL SUPPORT, EITHER TO PROVIDE EQUIPMENT OR SERVICES

NOT OTHERWISE AVAILABLE TO IAEA OR WHICH MIGHT BE EXPEDITED IN ORDER THAT THEY BE AVAILABLE AT AN EARLIER DATE THAN FORE-SEEN IF IAEA RESOURCES ALONE WERE USED. AFTER THOSE DISCUSSIONS, MISSION PREPARED DRAFT NARRATIVE AND RECOMMENDATIONS WHICH WERE REVIEWED BY ROMETSCH. THUS, LIST WHICH FOLLOWS REPRESENTS ONLY THOSE ITEMS IDENTIFIED, AT THIS TIME, BY IAEA STAFF AND EVALUATED BY MISSION. MANY OF THE ITEMS DEPEND UPON SUCCESSFUL AND EARLY COMPLETION OF DEVELOPMENT WORK, INCLUDING EVALUATION AND TESTING OF RESULTING PRODUCT. AS DEVELOPMENT WORK PROCEEDS OR AS NEW TECHNOLOGY BECOMES AVAILABLE, ITEMS MAY BE DELETED, MODIFIED, OR REPLACED WITH OTHERS. THUS, LIST SHOULD BE CONSIDERED AS PLANNING OUTLINE ONLY AND WE BELIEVE SHOULD BE KEPT UNDER MORE-OR-LESS CONTINUOUS REVIEW, WITH FORMAL REVIEW BY INTERESTED USG AGENCIES, MISSION AND IAEA AT LEAST ANNUALLY. FORMAL MECHANISM SHOULD ALSO BE ESTABLISHED TO CONSIDER PROPOSALS ORIGINATING EITHER WITHIN THOSE AGENCIES, FROM MISSION OR FROM IAEA. SUCH MECHANISM SHOULD TAKE FORM OF INTER-AGENCY COMMITTEE, WHICH WOULD ALSO MONITOR U.S. PROGRAM OF SUPPORT. RECOMMEND COMMITTEE BE HEADED BY INDIVIDUAL HAVING FULL-TIME RESPONSIBILITY FOR COORDINATING ENTIRE PROGRAM WHICH WILL REQUIRE DETAILED FAMILIARITY WITH IAEA SAFEGUARDS ORGANIZATION AND ACTIVITIES, AS WELL AS U.S. ORGANIZATIONS AND INDIVIDUALS ENGAGED IN RELEVANT ACTIVITIES. COORDINATED PROGRAM WILL INVOLVE WIDE RANGE OF ACTIVITIES, INCLUDING SELECTION OF CONTRACTORS, CONSULTANTS AND SUPPLIERS, NEGOTIATION OF CONTRACTS AND OTHER ARRANGEMENTS FOR DELIVERY OF GOODS AND SERVICES, PLANNING AND SCHEDULING OF VARIOUS ACTIVITIES, INCLUDING TRAINING COURSES, AS WELL AS CONTROL OF FUNDS. IT IS URGED THAT SUCH COORDINATOR BE NAMED ASAP IN ORDER TO PROVIDE POINT OF CONTACT FOR MISSION IN CONNECTION U.S. SUPPORT PROGRAM.

### 3. INTRODUCTION TO LIST

IAEA SAFEGUARDS RELY PRIMARILY UPON NUCLEAR MATERIAL ACCOUNTABILITY MEASURES TO PROVIDE TIMELY VERIFIED KNOWLEDGE OF QUANTITY, LOCATION AND USE OF SAFEGUARDED MATERIAL. THOSE SAFEGUARDS ARE INTENDED TO DETECT DIVERSIONS BY IMPOSING A HIGH RISK OF DETECTION. THE PROPOSED AREAS OF SUPPORT RELATE DIRECTLY TO MAINTAINING AND IMPROVING IAEA'S ABILITY TO LIMITED OFFICIAL USE

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ACHIEVE THOSE OBJECTIVES. AREA I, DATA PROCESSING, IS ESSENTIAL TO ORDERLY AND EFFICIENT USE OF INFORMATION CONCERNING QUANTITIES, LOCATION AND MOVEMENT OF MATERIALS. AREA II, FIELD INSTRUMENTS, IS DIRECTLY CONCERNED WITH VERIFICATION OF QUANTITY OF MATERIAL AT SPECIFIC LOCATIONS. AREA III, SURVEILLANCE AND CONTAINMENT DEVICES, RELATES TO VERIFICATION OF LOCATION AND USE OF MATERIAL. AREA IV, TRAINING, WILL CONTRIBUTE TO ASSURANCE THAT TECHNIQUES AND EQUIPMENT, SUCH

AS THOSE DISCUSSED IN THREE PRECEDING AREAS ARE EFFECTIVELY EMPLOYED. AREAS V AND VI, STUDIES AND CONSULTANTS, WILL CONTRIBUTE TO DEFINING CONTENT OF PRECEDING AREAS AND IN SAFEGUARDS IMPLEMENTATION IN ORDER TO MAINTAIN EFFECTIVENESS IN ALL SITUATIONS.

4. TEXT OF LIST:

I. DATA PROCESSING

A. FUTURE NEED FOR COMPUTER CAPACITY - HARDWARE.  
DURING 1975, ACCOUNTING RECORDS RECEIVED FROM STATES FOR AUTOMATIC DATA PROCESSING TOTALLED 30,000. THE VOLUME OF SUCH REPORTS IS PROJECTED BY THE INSPECTORATE TO DOUBLE WHEN REPORTS BEGIN TO ARRIVE FROM EURATOM MEMBER STATES, PRESUMABLY IN LATE 1976. IN 1977 THE VOLUME WILL INCREASE TO 120,000 (FULL REPORTING BY EURATOM AND JAPAN) AND TO 180,000 IN 1978 (NOT INCLUDING REPORTS FROM U.S. AND UK FACILITIES). IN ADDITION TO ACCOUNTING REPORTS FROM STATES, THE SYSTEM WILL BE REQUIRED TO PROCESS DATA OBTAINED BY INSPECTORS, RESULTS OF CHEMICAL ANALYSIS OF SAMPLES, DATA CONCERNING AGENCY SEALS IN USE, ADMINISTRATIVE INFORMATION, AS WELL AS PERFORM EVALUATIONS, COMPARISONS, ETC., OF ALL FOREGOING DATA. WHILE SAFEGUARDS DATA PROCESSING SHARE OF THE COSTS OF OPERATING THE IAEA'S COMPUTER CENTER WAS FIVE TO TEN PERCENT IN 1975, THAT SHARE WILL INCREASE IN 1976 TO 20 PERCENT, AND WILL CONTINUE TO INCREASE IN SUCCEEDING YEARS. THE COMPUTER IS CURRENTLY OPERATING AT ABOUT 80 PERCENT OF CAPACITY. TAKING INTO ACCOUNT PROJECTED INCREASED DEMANDS UPON THE COMPUTER CENTER BY INIS AND THE DIVISION OF BUDGET AND FINANCE, AND OTHER AGENCY ACTIVITIES, IT HAS BECOME CLEAR THAT THE CAPACITY OF THE PRESENT EQUIPMENT, EVEN WITH THE MAXIMUM ADDITION OF MEMORY CAPACITY, WILL BE EXHAUSTED NOT LATER LIMITED OFFICIAL USE

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THAN 1978. ACCORDINGLY, AN INTER-DEPARTMENTAL COMMITTEE HAS INITIATED A STUDY OF THE AGENCY'S NEEDS FOR

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ADDITIONAL COMPUTER CAPACITY, WITH THE OBJECTIVE OF MAKING RECOMMENDATIONS BY THE LAST QUARTER OF 1976, IN ORDER THAT PROVISION BE MADE IN THE AGENCY'S BUDGET FOR 1978 FOR ITS PROCUREMENT. LEASE OF A NEW COMPUTER AND RELATED EQUIPMENT TO PROVIDE ADDITIONAL CAPACITY SUFFICIENT FOR ALL OF THE AGENCY'S NEEDS FORESEEN FOR ABOUT FIVE YEARS BEYOND 1978 MAY COST AS MUCH AS \$800,000 PER YEAR (ONLY SOME FRACTION OF WHICH, HOWEVER, WOULD BE ATTRIBUTABLE TO SAFEGUARDS), ASSUMING THE PRESENT EQUIPMENT, OWNED BY THE AGENCY, IS RETAINED AND CONTINUES TO OPERATE SATISFACTORILY DURING THAT PERIOD. THE LATTER ASSUMPTION MAY BE QUESTIONABLE, IN LIGHT OF THE FACT THAT THE PRESENT IBM 145 HAS BEEN OPERATING SINCE 1972. BEARING MIND THAT DELIVERY TIME FOR NEW COMPUTERS OF THE SIZE AND TYPE WHICH ARE LIKELY TO BE REQUIRED IS NOT LESS THAN 12 MONTHS FROM THE DATE OF PLACEMENT OF A FIRM ORDER, AND THAT ADDITIONAL CAPACITY WILL BE NEEDED IN EARLY 1978 (IF NOT IN LATE 1977), ASSISTANCE BY THE USG MAY BE HELPFUL IN ARRANGEMENTS WHICH WILL PERMIT PLACEMENT OF A FIRM ORDER AS EARLY AS POSSIBLE. FOR EXAMPLE, IT MAY BE POSSIBLE FOR THE USG TO FUND PART OR ALL OF THE INITIAL PAYMENT (FIRST YEAR'S LEASE CHARGES?) REQUIRED BY THE SUPPLIER IN CONNECTION WITH A FIRM ORDER PLACED IN LATE 1976 OR EARLY 1977. ON OTHER HAND, CERTAIN SUPPLIERS APPARENTLY HAVE BEEN WILLING, IN THE LIMITED OFFICIAL USE

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PAST, TO PROCEED ON THE BASIS OF A LETTER OF INTENT.

MISSION RECOMMENDATION: TOP PRIORITY, ON CONTINGENT BASIS:  
I.E., IF U.S. FUNDS REQUIRED IN ORDER TO FACILITATE DELIVERY AT AN EARLY DATE.

B. FUTURE NEEDS - SOFTWARE.

IN PARALLEL WITH EXAMINATION OF FUTURE HARDWARE NEEDS OF THE IAEA AS A WHOLE, THE INSPECTORATE PLANS TO CONSIDER ITS NEEDS FOR SOFTWARE TO BE USED IN CONNECTION WITH EXISTING AND WITH THE EXPANDED COMPUTER CAPACITY. IN PARTICULAR, COMMERCIALY AVAILABLE DATA BASE MANAGEMENT SYSTEMS, SUCH AS IMS, ADABAS, AND 2000 WILL BE EVALUATED BY CONSULTANTS, AS RESULT OF INSPECTORATE CONCLUSION THAT PURCHASE OR LEASE OF SUCH SYSTEMS MIGHT BE PREFERABLE TO IN-HOUSE DEVELOPMENT. AFTER SELECTION OF ONE OR MORE SYSTEM(S) JUDGED SUITABLE, THE SYSTEM(S) MUST BE TESTED ON THE TYPE OF DATA FORESEEN TO BE HANDLED. CONSULTANTS WILL ALSO BE REQUIRED FOR SUCH TESTING. THE COST OF PURCHASING SUCH SYSTEMS, NOT INCLUDING THE COST OF CONSULTANTS TO EVALUATE THE VARIOUS COMPETING SYSTEMS AND TESTING THE SELECTED SYSTEM(S), IS EXPECTED TO BE ON THE ORDER OF \$115,000. COSTS OF CONSULTANTS MAY ADD \$10,000 TO \$20,000.

MISSION RECOMMENDATION: TOP PRIORITY - CONSULTANTS TO ASSIST IN EVALUATION AND TESTING OF DATA BASE MANAGEMENT SYSTEMS SHOULD BE AVAILABLE IN ABOUT OCTOBER. PROCUREMENT WOULD TAKE PLACE IN 1977.

C. PEAK-LOAD PROGRAMMING PERSONNEL NEEDS.

DURING THE PERIOD (1977) OF TRANSITION BY THE INSPECTORATE FROM THE USE ONLY OF THE EXISTING COMPUTER TO THE USE OF THE NEW SOFTWARE AND EQUIPMENT, AN EXTRAORDINARY AMOUNT OF PROGRAMMING WILL BE REQUIRED. THAT PEAK IS EXPECTED TO LAST ABOUT SIX MONTHS AND WILL REQUIRE 10 TO 15 TEMPORARY PROGRAMMERS AT A COST OF UP TO \$200,000. ALTERNATIVELY, THE PEAK PROGRAMMING LOAD MIGHT BE CONTRACTED OUT, WITH IAEA STAFF MEMBERS DETAILED TO WORK WITH THE CONTRACTORS.

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MISSION RECOMMENDATION: TOP PRIORITY - 1977.

D. IMMEDIATE NEED FOR PERIPHERAL EQUIPMENT.

THE MOST URGENT NEED IS FOR A REMOTE INPUT/OUTPUT TERMINAL FOR USE OF SAFEGUARDS INFORMATION UNIT, IN ORDER TO AVOID THE PRESENT NECESSITY FOR DELIVERING PUNCHED CARDS TO CENTRAL COMPUTER UNIT, FOR EXAMPLE. IT MAY ALSO BE DESIRABLE TO INCREASE MEMORY CAPACITY AND ADD OTHER PERIPHERAL EQUIPMENT TO THE PRESENT EQUIPMENT, IN ORDER TO EXPLOIT THE FULL CAPACITY OF THE PRESENT COMPUTER. DETAILS OF SUCH POSSIBLE ADDITIONS, AND THEIR COSTS, ARE NOT YET AVAILABLE.

MISSION RECOMMENDATION: TOP PRIORITY - 1976 OR 1977, IN

ESTIMATED AMOUNT OF \$200,000.

## II. INSTRUMENTS FOR USE BY INSPECTORS IN THE FIELD

### A. GAMMA-RAY SPECTROMETERS.

THE MOST GENERALLY USEFUL NON-DESTRUCTIVE ANALYSIS (NDA) TECHNIQUE AT PRESENT IS GAMMA-RAY SPECTROSCOPY, THE SYSTEM FOR WHICH IS COMPRISED OF 1) DETECTOR, 2) MULTI-CHANNEL ANALYZER AND 3) DATA EVALUATION EQUIPMENT. IDEALLY, THE DETECTOR AND MULTI-CHANNEL ANALYZER SHOULD BE READILY TRANSPORTABLE AND CAPABLE OF SELF-SUSTAINED RELIABLE OPERATION IN THE FIELD. AT PRESENT, A TAPE RECORDING MULTI-CHANNEL ANALYZER (SILENA, OF ITALIAN MANUFACTURE, PRICE ABOUT \$7,000 EACH) IS AVAILABLE WHICH MEET THOSE CRITERIA. IN THE CASE OF DETECTORS, INTRINSIC GERMANIUM DETECTORS ARE THE BEST NOW AVAILABLE, BUT REQUIRE LIQUID NITROGEN FOR COLLING AND THEIR SMALL DETECTOR VOLUMES NECESSITATE LONG COUNTING TIMES. SODIUM IODIDE DETECTORS DO NOT HAVE THOSE DEFICIENCIES BUT HAVE LOW RESOLUTION. CADMIUM TELLURIDE DETECTORS HAVE BEEN UNDER DEVELOPMENT (IN U.S. FIRMS SUCH AS MOBIL TYCO SOLAR ENERGY CORP., WALTHAM MASS., AND HUGHES RESEARCH LABS., MALIBU, CAL.) AND SHOW PROMISE OF BETTER RESOLUTION, WITHOUT THE NEED FOR LIQUID NITROGEN COOLING. DEVELOPMENT OF SUCH DETECTORS COULD PROBABLY BE EXPEDITED BY SUPPLEMENTAL FUNDS TO THE FIRMS CONCERNED. ONCE AN IMPROVED DETECTOR IS DEVELOPED, A NEED FOR UP TO FIFTY DETECTORS (AT ABOUT \$10,000 EACH) AND SILENA MULTI-CHANNEL ANALYZERS IS FORESEEN BY LIMITED OFFICIAL USE

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THE INSPECTORATE. DATA EVALUATION EQUIPMENT WHICH READS AND EVALUATES TAPES RECORDED BY MULTI-CHANNEL ANALYZER, IS COMMERCIALY AVAILABLE. AT LEAST ONE SUCH UNIT IS REQUIRED AT HEADQUARTERS. WHETHER PRESENTLY AVAILABLE EQUIPMENT WILL BE SATISFACTORY AND THE NUMBER REQUIRED ARE NOT YET KNOWN.

MISSION RECOMMENDATION: 1. SUPPLEMENTAL FUNDING OF CD-TE DETECTOR DEVELOPMENT BE MADE AVAILABLE: TOP PRIORITY - 1976, AMOUNT TO BE DETERMINED IN DISCUSSION WITH INVESTIGATORS INVOLVED, BUT ESTIMATED TO BE \$100,000.

2. PRODUCTION MODEL PROCUREMENT: SECOND PRIORITY - 1977 AND BEYOND, AT RATE DETERMINED BY MANUFACTURING CAPACITY AND AVAILABILITY OF FUNDS. PROCUREMENT OF

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MULTI-CHANNEL ANALYZERS AT SAME RATE. EACH SUCH SYSTEM WOULD COST ABOUT \$15,000; THUS, PROCUREMENT A RATE OF TWENTY SYSTEMS PER YEAR, BEGINNING IN 1978 WOULD ENTAIL EXPENDITURE OF ABOUT \$300,000 PER YEAR. TOTAL COST OF FIFTY SYSTEMS WOULD BE ABOUT \$750,000.

B. OTHER FIELD INSTRUMENTS AND MATERIALS.

FOR USE BY INSPECTORS IN THE FIELD, IAEA HAS A CONTINUING NEED FOR PORTABLE NEUTRON, NEUTRON-COINCIDENCE AND/OR NEUTRON, GAMMA-COINCIDENCE COUNTERS AND PORTABLE CALORIMETERS, AS WELL AS PHYSICAL STANDARDS FOR CALIBRATING NDA INSTRUMENTS. IN ADDITION, THERE WILL BE A CONTINUING NEED FOR CHEMICAL STANDARDS AND SECONDARY REFERENCE MATERIALS FOR LABORATORY ANALYSIS OF SAFEGUARDS SAMPLES. ACCESSORIES FOR IAEA'S MASS SPECTROMETER, SUCH AS AUTOMATIC BALANCES, WILL ALSO BE USEFUL.

MISSION RECOMMENDATION: SPECIFIC NEEDS OF IAEA SHOULD BE EXAMINED FOR SUCH EQUIPMENT AND MATERIALS AND AVAILABILITY DETERMINED. IN SOME CASES, SUCH LIMITED OFFICIAL USE

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AS AUTOMATIC BALANCES, ITEM CAN BE READILY PURCHASED. IN OTHER CASES, MODIFICATION OF STANDARD ITEM OR DEVELOPMENT OF NEW VERSION MAY BE REQUIRED TO MEET IAEA SPECIFICATIONS. FOR PHYSICAL AND CHEMICAL STANDARDS (FOR WHICH U.S. IS PRINCIPAL IF NOT UNIQUE SOURCE), TOP PRIORITY-BEGINNING 1976. FOR OTHERS, PRIORITY WILL VARY. FOR PLANNED PURPOSES, RATE OF \$100,000 PER YEAR SHOULD BE ASSUMED FOR PROCUREMENT, INCLUDING NECESSARY MODIFICATION OR DEVELOPMENT, OF ITEMS IN THIS CATEGORY, BEGINNING IN 1976.

#### C. TRANSPORTABLE NDA KITS.

LONGER-TERM NEED IS FORESEEN FOR STANDARD TRANSPORTABLE KITS COMPRISING SEVERAL NDA SYSTEMS, COVERING FULL RANGE OF SPECIFIC TECHNIQUES FOR USE IN EACH FACILITY WHERE SUCH TECHNIQUES ARE APPLICABLE. ALL NECESSARY INSTRUMENTS, SPARE PARTS, AND STANDARDS FOR MEASUREMENTS TO BE PERFORMED WOULD BE INCLUDED. KITS WOULD BE TRANSPORTABLE BY AIR. SUCH KITS ARE ESTIMATED TO COST ABOUT \$100,000 WHEN AVAILABLE.

MISSION RECOMMENDATION: STUDY OF NEEDS FOR AND SPECIFICATION FOR SUCH KITS SHOULD BE UNDERTAKEN. TOP PRIORITY-1977, AT COST ESTIMATED AT \$50,000. AT APPROPRIATE TIME (POSSIBLY 1978), CONSIDERING STATE OF DEVELOPMENT AND MANUFACTURE OF VARIOUS APPLICABLE NDA INSTRUMENTATION, PROCURE PROTOTYPE FOR FIELD TEST AND LATER PROCUREMENT IN QUANTITY NEEDED. SECOND PRIORITY- 1978 AND BEYOND AT ESTIMATED COST FOR PROTOTYPES OF \$150,000 EACH AND SUBSEQUENT PROCUREMENT IN QUANTITY AT \$100,000 AT RATE DETERMINED BY NEEDS, RATE OF DELIVERY, AND FUNDS AVAILABLE. (NOTE THAT IT IS PRESUMED THAT GAMMA-RAY SPECTROMETRIC AND OTHER EQUIPMENT PROCURED UNDER PRECEDING ITEMS WOULD BE INCLUDED IN KITS FOR FACILITIES WHERE APPLICABLE.)

#### III. EQUIPMENT FOR SURVEILLANCE AND CONTAINMENT LIMITED OFFICIAL USE

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#### A. RECORDING TV SYSTEM.

TAPE-RECORDING CLOSED-CIRCUIT TELEVISION SYSTEMS, ASSEMBLED IN AUSTRIA, USING COMPONENTS OF JAPANESE ORIGIN HAVE RECENTLY BEEN PUT INTO SERVICE BY THE INSPECTORATE, TO REPLACE OR SUPPLEMENT PHOTOGRAPHIC CAMERA SURVEILLANCE EQUIPMENT. TAPE RECORDINGS



MAY BE READ ELECTRONICALLY AND REPRODUCED IN THE FIELD. IF INITIAL ENTHUSIASM BY THE INSPECTORATE IS CONFIRMED BY FURTHER FIELD USE, IT IS ANTICIPATED THAT MANY, IF NOT ALL, EXISTING PHOTOGRAPHIC CAMERA INSTALLATIONS WILL BE REPLACED WITH THE TV SYSTEM AND THAT THE TV SYSTEM WILL BE USED IN ALL FUTURE OPTICAL SURVILLANCE SITUATIONS. ULTIMATELY, PERHAPS 100 OR MORE SUCH UNITS ARE FORESEEN TO BE IN USE. PROCUREMENT COST OF THE TV SYSTEM IN QUANTITY IS ESTIMATED TO BE \$10,000 TO \$12,000 EACH.

MISSION RECOMMENDATION: 1. ASSISTANCE IN EVALUATING UTILITY OF SUCH SYSTEMS, PARTICULARLY VULNERABILITY TO INTRODUCTION OF FALSE VIDEO SIGNALS INTO RECORDING COMPONENTS: TOP PRIORITY- 1976, ESTIMATED AT \$50,000.

2. IF EVALUATION CONFIRMS UTILITY, PROCURE UNITS AT RATE DICTATED BY DELIVERY SCHEDULE, TIME NEEDED FOR INSTALLATION AND AVAILABILITY OF FUNDS. SECOND PRIORITY-1977 AND BEYOND WITH TOTAL COST OF ABOUT \$1 MILLION FOR 100 UNITS.

B. SEALS.

MORE SOPHISTICATED SEALING DEVICES REMAIN AN URGENT REQUIREMENT OF THE INSPECTORATE. FIBER OPTIC SEALS HAVE BEEN UNDER DEVELOPMENT IN THE U.S. FOR SOME TIME (HARRY DIAMOND LABORATORY) BUT AN OPTIMAL UNIT FOR FIELD USE HAS NOT BEEN DEVELOPED AND DEMONSTRATED. MORE RECENTLY, BOTH AT SANDIA AND AT JULICH CENTER (FRG), PROMISING WORK HAS BEEN UNDERWAY ON "SELF-MONITORING" SEALING DEVICES WHICH WILL INDICATE ELECTRONICALLY THAT THE DEVICE HAS BEEN TAMPERED WITH. THE POSSIBILITY OF RADIO TRANSMISSION OF SUCH LIMITED OFFICIAL USE

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INDICATION IS ALSO UNDER CONSIDERATION. ASSISTANCE IN THE FORM OF ADDITIONAL FUNDS OR EQUIPMENT MAY BE USEFUL IN EXPEDITING THE DEVELOPMENT OF SUCH DEVICES, WHICH WOULD BE PARTICULARLY APPLICABLE TO SITUATIONS, SUCH AS LOCATIONS WHERE SUBSTANTIAL QUANTITIES OF PU ARE IN USE OR IN STORAGE, WHERE RAPID DETECTION OF POSSIBLE DIVERSION IS ESSENTIAL.

MISSION RECOMMENDATION: 1. EXPEDITE EVALUATION OF WORK ON FIBER-OPTIC SEALS AND COMPLETE DEVELOPMENT, INCLUDING FIELD DEMONSTRATION, IF APPROPRIATE. TOP PRIORITY- 1976, ESTIMATED COST \$75,000.

2. EVALUATE PROGRESS ON "SELF-MONITORING" DEVICES

AND PROVIDE ADDITIONAL RESOURCES TO EXPEDITE COMPLETION, INCLUDING DEMONSTRATION. TOP PRIORITY- 1976, COST TO BE DETERMINED, PERHAPS \$150,000.

3. ASSISTANCE IN PROCUREMENT OF SOPHISTICATED SEALING DEVICES; ONCE SUCCESSFULLY DEMONSTRATED. SECOND PRIORITY- 1977 AND BEYOND. COST CANNOT BE ESTIMATED AT PRESENT, BUT LARGE QUANTITIES OF CONVENTIONAL SEALS ARE ALREADY IN USE AND FORESEEN. SOOPHISTICATED DEVICES, SUCH AS "SELF-MONITORING" SEALS, WILL BE SUBSTANTIALLY MORE EXPENSIVE TO PURCHASE. NUMBERS OF SOPHISTICATED DEVICES REQUIRED WILL DEPEND UPON THEIR CHARACTERISTICS AND COST AND THE NUMBER OF SITUATIONS WHICH WILL JUSTIFY THEIR USE.

#### IV. TRAINING OF SAFEGUARDS PERSONNEL

VARIOUS LEVELS AND TYPES OF TRAINING REQUIREMENTS ARE FORESEEN FOR BOTH IAEA PERSONNEL AND THOSE OF MEMBER

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STATES NATIONAL SYSTEMS. THESE INCLUDE A) TRAINING OF IAEA SAFEGUARDS PERSONNEL IN NDA INSTRUMENT USE, ON BOTH BASIC

AND ADVANCED LEVELS, B) TRAINING OF IAEA SAFEGUARDS TECHNICIANS IN THE INSTALLATION AND MAINTENANCE OF NDA AND OTHER SPECIAL INSTRUMENTS AND DEVICES, C) TRAINING OF IAEA SAFEGUARDS PERSONNEL IN SAMPLING, ANALYSIS, ETC., INVOLVED IN PHYSICAL AND CHEMICAL ANALYSIS AND D) TRAINING OF PERSONNEL FROM MEMBER STATES IN ASPECTS OF STATE SYSTEMS OF ACCOUNTING AND CONTROL. IN ADDITION TO SUCH FORMAL COURSES, IAEA WOULD LIKE TO FIND WAYS BY WHICH ITS PERSONNEL COULD BECOME FAMILIAR WITH DETAILED TECHNICAL CHARACTERISTICS OF BULK-HANDLING FACILITIES (E.G., FUEL FABRICATION AND REPROCESSING PLANTS) SINCE PERSONNEL WITH EXPERIENCE IN SUCH FACILITIES HAVE BEEN DIFFICULT TO RECRUIT FOR THE INSPECTORATE. MISSION RECOMMENDATION: ALTHOUGH THE PRECISE NATURE OF TRAINING, NUMBER OF PARTICIPANTS, FREQUENCY, ETC., REQUIRE FURTHER STUDY, IT IS CLEAR THAT A CONTINUING REQUIREMENT WILL EXIST. TOP PRIORITY - AT AN ESTIMATED RATE OF \$100,000 PER YEAR, BEGINNING IN 1977.

#### V. STUDIES

IAEA FORESEES A WIDE VARIETY OF STUDIES BEING USEFUL IN THE LIMITED OFFICIAL USE

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DEVELOPMENT AND IMPLEMENTATION OF SAFEGUARDS. THESE INCLUDE A) SYSTEM STUDIES OF DIVERSION STRATEGIES, ON A GLOBAL SCALE AND FOR INDIVIDUAL FACILITIES, WHICH WOULD HELP IDENTIFY THE MOST SENSITIVE LOCATIONS FROM THE STANDPOINT OF SAFEGUARDS, B) STUDIES OF POSSIBLE DESIGN FEATURES AND OPERATING MODES OF VARIOUS TYPES OF FACILITIES WHICH WOULD FACILITATE SAFEGUARDS. IN THE FIELD OF SAFEGUARDS INFORMATION PROCESSING, STUDIES ON A) UTILITY AND FEASIBILITY OF REGIONAL DATA PROCESSING CENTERS AND B) SECURITY OF COMMERCIAL DATA BASE MANAGEMENT SYSTEMS WOULD BE USEFUL.

MISSION RECOMMENDATION: WITHOUT, AT THIS TIME, SPECIFYING THE TYPE, SCOPE, ETC., OF THE STUDIES, IT IS REASONABLE TO ASSUME THAT THE IAEA WILL BENEFIT FROM A VARIETY OF STUDIES DEALING WITH PARTICULAR ASPECTS OF ITS SAFEGUARDS ACTIVITIES. TOP PRIORITY - \$100,000 PER YEAR BEGINNING 1977.

#### VI. CONSULTANTS

FOR A NUMBER OF TOPICS AND SPECIAL PROBLEMS, THE IAEA MAY BE BEST ASSISTED BY HAVING EXPERTS IN THE SUBJECT VISIT VIENNA FOR FROM ONE TO SEVERAL WEEKS. EXAMPLES OF SUCH TOPICS ARE A) APPLICATION OF STATISTICAL TECHNIQUES, INCLUDING EVALUATION OF INSPECTOR DATA, B) APPLICATIONS OF ISOTOPIC CORRELATION TECHNIQUES, C) REVIEW AND UPDATING SAFEGUARDS TECHNICAL MANUAL, D) QUALITY CONTROL PROGRAM FOR CHEMICAL ANALYSES BY THE IAEA'S NETWORK OF LABORATORIES UNDER CONTRACT AND, AT A LATER STAGE, FOR STATE LABORATORIES.

MISSION RECOMMENDATION: THERE WILL BE A CONTINUING NEED FOR SUCH CONSULTANTS. CHARGES WILL VARY, DEPENDING UPON WHETHER A PARTICULAR CONSULTANT IS AN EMPLOYEE OF THE USG, ONE OF ITS CONTRACTORS, ETC. FOR PLANNING PURPOSES, \$50,000 PER YEAR SHOULD BE ASSUMED. TOP PRIORITY - BEGINNING 1976.

VII. MISCELLANEOUS

A NUMBER OF OTHER FORMS OF ASSISTANCE HAVE BEEN IDENTIFIED AS USEFUL TO IAEA SAFEGUARDS ACTIVITIES. SOME MAY NOT REQUIRE THE DIRECT EXPENDITURE OF FUNDS, BUT MAY REQUIRE THE ASSIGNMENT OF TASKS TO USG PERSONNEL OR OTHER ACTION. THESE INCLUDE THE FOLLOWING:

A. IN ITS CHEMICAL ANALYSIS PROGRAM, IAEA HAS ENCOUNTERED LIMITED OFFICIAL USE

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PROBLEMS IN TRANSPORTING SAMPLES CONTAINING PU. IN SOME CASES, AIRLINE PERSONNEL HAVE REFUSED TO ACCEPT SUCH SAMPLES, NOTWITHSTANDING COMPLIANCE WITH THE STATE'S REGULATIONS. IN OTHER CASES, IAEA HAS BEEN UNABLE TO ASCERTAIN WHAT REGULATIONS, IF ANY, EXIST IN A STATE OR WHICH STATE'S REGULATIONS ARE APPLICABLE IN A GIVEN SITUATION. SOME INITIATIVE MIGHT BE TAKEN TOWARD ACTION ON AN INTERNATIONAL BASIS TO FACILITATE TRANSPORT OF IAEA SAMPLES.

B. AT PRESENT, OPERATION OF IAEA'S SAFEGUARDS ANALYTICAL LABORATORY IS LIMITED BY THE AUSTRIAN LICENSING REQUIREMENT THAT ARRANGEMENTS BE MADE FOR THE PERMANENT DISPOSAL OF PU-BEARING WASTES. NO FACILITY FOR SUCH DISPOSAL IS EXPECTED TO BE AVAILABLE IN AUSTRIA. THEREFORE, A LONG-TERM GUARANTEE WILL BE REQUIRED FROM SOME OTHER GOVERNMENT TO BE THE REPOSITORY, IF CALLED UPON, FOR PU-BEARING WASTE GENERATED BY IAEA'S LABORATORY. THE QUANTITY OF PU IN SUCH WASTES IS NOT EXPECTED TO EXCEED 200 GRAMS PER YEAR, AND WILL PROBABLY BE MUCH LESS THAN THAT AMOUNT. IF THE USG COULD PROVIDE THE NECESSARY GUARANTEE, IT WOULD FACILITATE THE ISSUANCE OF THE NECESSARY LICENSE BY THE AUSTRIAN AUTHORITIES.

C. IN CONNECTION WITH QUALITY ASSURANCE OF THE IAEA SAFEGUARDS ANALYTICAL NETWORK OF CONTRACT LABORATORIES (AND EVENTUALLY FACILITY LABORATORIES), IAEA WOULD LIKE TO EXPLORE THE POSSIBILITY OF INSTITUTING A PROGRAM SIMILAR TO THE SALE PROGRAM CONDUCTED BY ERDA. SUCH A PROGRAM WOULD INVOLVE THE PREPARATION AND CHARACTERIZATION OF SAMPLES FOR ANALYSIS, THEIR DISTRIBUTION TO LABORATORIES AND EVALUATION OF RESULTS. THE EXISTING ERDA ORGANIZATION HAS BEEN CARRYING OUT THESE TASKS FOR U.S. DOMESTIC LABORATORIES FOR SEVERAL YEARS. A SIMILAR SERVICE FOR THE IAEA NETWORK WOULD PROVIDE CONFIDENCE IN THE ANALYTICAL RESULTS OBTAINED ON SAFEGUARDS SAMPLES.

D. IN THE DEVELOPMENT OF NEW SURVEILLANCE, CONTAINMENT AND NON-DESTRUCTIVE ANALYTICAL TECHNIQUES AND EQUIPMENT, THE IAEA SHOULD INVESTIGATE THEIR APPLICABILITY TO VARIOUS TYPES OF FACILITIES BEFORE THEIR EMPLOYMENT IN ACTUAL PLANTS UNDER SAFEGUARDS. ACCESS TO U.S. FACILITIES FOR SUCH TESTING AND EVALUATION ON A REGULAR BASIS WOULD ASSIST THE IAEA IN ITS DEVELOPMENT PROGRAM AND IN MAKING THE MOST EFFECTIVE USE OF LIMITED OFFICIAL USE

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NEW TECHNIQUES AND EQUIPMENT.

E. IT WOULD BE USEFUL FOR THE IAEA TO COMPLETE THE JOINT (PAPER) EXERCISES ON THE DRESDEN POWER STATION AND THE GE-WILMINGTON FUEL FABRICATION PLANT AND TO UNDERTAKE SIMILAR EXERCISES ON OTHER U.S. FACILITIES, INCLUDING BARNWELL REPROCESSING PLANT, ENRICHMENT PLANTS, MIXED-OXIDE FUEL FABRICATION PLANTS, ETC.  
MISSION RECOMMENDATION: ASSISTANCE OF THE TYPE NOTED SHOULD BE CONSIDERED IN ANY EVENT AND, WHERE ASSISTANCE IS FOUND TO BE FEASIBLE AND DESIRABLE, ANY ADDITIONAL

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ACTION OES-06

INFO OCT-01 IO-13 ISO-00 FEA-01 ACDA-07 CIAE-00 INR-07

L-03 NSAE-00 NSC-05 EB-07 NRC-05 DODE-00 /055 W

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RESOURCES REQUIRED COULD BE PROVIDED FROM SPECIAL FUNDS. FOR EXAMPLE, THE USG MIGHT HOST A

MEETING OF REPRESENTATIVES OF GOVERNMENTS TO DEAL WITH THE PROBLEM OF TRANSPORT OF PU-BEARING SAMPLES. ON CONTINGENCY BASIS, SECOND PRIORITY PERHAPS \$25,000 PER YEAR MAY BE ASSUMED TO BE AVAILABLE TO FACILITATE ASSISTANCE OF THE TYPE OUTLINED.

5. MISSION WISHES STRESS THAT FOREGOING IS INITIAL LIST AS PERCEIVED BY IAEA STAFF AND REVIEWED BY MISSION. STAFF OF MISSION IS ALSO CONSIDERING ITEMS FOR POSSIBLE ADDITION. FOR EXAMPLE, IDEA OF USING SHORT-WAVE TRANSMITTING SLOW-SCAN TV FOR SURVEILLANCE HAS BEEN SUGGESTED, BUT MISSION HAS NOT YET HAD OPPORTUNITY TO EXPLORE IN DETAIL WITH APPROPRIATE WORKING-LEVEL IAEA STAFF. AS SUCH IDEAS ARE DEVELOPED MORE FULLY, WE WILL SEND THEM IN FOR CONSIDERATION. IT HAS ALSO BEEN SUGGESTED THAT THERE MAY BE SOME SPECIAL STUDIES USEFUL TO SAGSI OR TO U.S. MEMBER OF SAGSI AND THAT A PORTION OF THE FUNDS AVAILABLE BE RESERVED FOR THAT PURPOSE. LIMITED OFFICIAL USE

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6. IN PUBLIC PRESENTATIONS OF SUBJECT PROGRAM, MISSION IS CONCERNED ABOUT POSSIBLE EFFECT ON IAEA SAFEGUARDS BUDGET. WE HAVE STRESSED TO IAEA STAFF THAT U.S. PROGRAM IS INTENDED TO SUPPLEMENT IAEA BUDGET. SAFEGUARDS BUDGET REQUESTS SHOULD CONTINUE TO COVER IAEA BASE PROGRAM OF DEVELOPMENT, EQUIPMENT PROCUREMENT, ETC. IF AND WHEN USG COMMITS FUNDS FOR PARTICULAR PURPOSES IAEA MAY TAKE THAT ACTION INTO ACCOUNT IN PREPARING FUTURE BUDGET REQUESTS OR BY REPROGRAMMING CURRENT YEAR'S FUNDS. IT IS ESSENTIAL THAT MEMBER STATES NOT BE IN POSITION TO JUSTIFY REDUCTION OF IAEA SAFEGUARDS BUDGET FOR BASE PROGRAM BECAUSE OF EXISTENCE OF U.S. SUPPORT PROGRAM. ACCORDINGLY, WE SUGGEST PUBLIC PRESENTATIONS SPEAK ONLY OF FAIRLY BROAD CATEGORIES OF ASSISTANCE, WITHOUT IDENTIFYING SPECIFIC TYPES OF EQUIPMENT TO BE PURCHASED, FOR EXAMPLE.

7. IN ANY EVENT, WE FORESEE THE NEED TO WORK CLOSELY WITH IAEA STAFF IN PREPARATION OF THOSE PORTIONS OF 1978 BUDGET ESTIMATES TO WHICH U.S. SUPPORT PROGRAM RELATES. ESTIMATES FOR 1978 WILL BE PREPARED IN OCTOBER-NOVEMBER. THEREFORE, IT

WILL BE NECESSARY FOR MISSION TO HAVE IN HAND, BY  
THAT TIME, OUTLINE OF U.S. PROGRAM FOR 1977 AND  
1978 FOR DISCUSSION AND COORDINATION WITH IAEA. THIS  
SUGGESTS THAT FIRST OF ANNUAL REVIEWS, MENTIONED  
ABOVE, TAKE PLACE IN EARLY OCTOBER. STONE

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## Message Attributes

**Automatic Decaptioning:** X  
**Capture Date:** 01 JAN 1994  
**Channel Indicators:** n/a  
**Current Classification:** UNCLASSIFIED  
**Concepts:** NUCLEAR SAFEGUARDS, PROGRAMS (PROJECTS), INTERNATIONAL ORGANIZATIONS  
**Control Number:** n/a  
**Copy:** SINGLE  
**Draft Date:** 21 JUL 1976  
**Decaption Date:** 01 JAN 1960  
**Decaption Note:**  
**Disposition Action:** RELEASED  
**Disposition Approved on Date:**  
**Disposition Authority:** GolinoFR  
**Disposition Case Number:** n/a  
**Disposition Comment:** 25 YEAR REVIEW  
**Disposition Date:** 28 MAY 2004  
**Disposition Event:**  
**Disposition History:** n/a  
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**Disposition Remarks:**  
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**Drafter:** n/a  
**Enclosure:** n/a  
**Executive Order:** N/A  
**Errors:** N/A  
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**Page Count:** 14  
**Previous Channel Indicators:** n/a  
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**Previous Handling Restrictions:** n/a  
**Reference:** 76 STATE 161453  
**Review Action:** RELEASED, APPROVED  
**Review Authority:** GolinoFR  
**Review Comment:** n/a  
**Review Content Flags:**  
**Review Date:** 24 MAR 2004  
**Review Event:**  
**Review Exemptions:** n/a  
**Review History:** RELEASED <24 MAR 2004 by greeneet>; APPROVED <25 MAR 2004 by GolinoFR>  
**Review Markings:**

Margaret P. Grafeld  
Declassified/Released  
US Department of State  
EO Systematic Review  
04 MAY 2006

**Review Media Identifier:**  
**Review Referrals:** n/a  
**Review Release Date:** n/a  
**Review Release Event:** n/a  
**Review Transfer Date:**  
**Review Withdrawn Fields:** n/a  
**Secure:** OPEN  
**Status:** NATIVE  
**Subject:** U.S. SUPPORT PROGRAM FOR IAEA SAFEGUARDS  
**TAGS:** PARM, TECH, US, IAEA  
**To:** STATE  
**Type:** TE  
**Markings:** Margaret P. Grafeld Declassified/Released US Department of State EO Systematic Review 04 MAY 2006